

Claims

1. An infrared ( $IR_T$ ) reflective flake (1) comprising an infrared reflective core flake (4) and an infrared transparent material (2, 6) which is coated on some or all of the surface of the core flake (4) wherein the reflector core (4) has a thickness of less than  $0.2\ \mu\text{m}$ .
2. A flake (1) as claimed in claim 1 wherein the core (4) has a DC electrical resistivity in the range  $0.1$  to  $50\ \Omega\text{cm}^{-1}$ .
3. A flake (1) as claimed in claim 1 wherein the core (4) is aluminium and has thickness in the range  $0.03$  to  $0.04\ \mu\text{m}$ .
4. A flake (1) as claimed in claim 1 wherein the core (4) is chromium and has a thickness in the range  $0.08$  to  $0.12\ \mu\text{m}$ .
5. A flake (1) as claimed in any preceding claim wherein the core flake (4) has a surface texture of less than  $1\ \mu\text{m}$  and a depth to pitch ratio of less than  $0.5$ .
6. A flake (1) as claimed in claim 5 wherein the texture is in the range  $0.2$  to  $0.4\ \mu\text{m}$ .
7. A flake (1) as claimed in any preceding claim wherein the flake (1) has a diameter of  $10$  to  $100\ \mu\text{m}$ .
8. A flake (1) as claimed in claim 7 wherein the diameter is in the range  $10$  –  $50\ \mu\text{m}$ .
9. A flake (1) as claimed in claim 8 wherein the diameter is in the range  $30$  –  $40\ \mu\text{m}$ .
10. A flake (1) as claimed in any preceding claim wherein the infrared transparent material (2, 6) comprises a non-polar or weakly polar organic polymer that optionally contains a coloured dye or other coloured material.
11. A flake (1) as claimed in claim 10 wherein the infrared transparent material (2, 6) thickness is in the range  $0.2$  to  $2\ \mu\text{m}$ .
12. A flake (1) as claimed in claims 1-11 wherein the infrared transparent material (2, 6) comprises an inorganic film that optionally contains a coloured dye or other coloured material.

13. A flake (1) as claimed in any preceding claim wherein the core (4) has a thickness of less than 1 nm.
14. A flake (1) as claimed in claim 13 wherein the DC resistivity is less than  $10 \Omega \square^{-1}$ .
15. A flake (1) as claimed in any of claims 10, 11 or 12 wherein the core (4) comprises indium or fluorine doped tin oxide.
16. A flake (1) as claimed in any of claims 13 to 15 wherein the transparent covering material (2, 6) completely encapsulates the core material.
17. A paint formulation comprising infrared reflective flakes (1) according to any of claims 1-16.
18. A varnish formulation comprising infrared reflective flakes (1) according to any of claims 1-16.
19. A gel coat formulation comprising infrared reflective flakes (1) according to any of claims 1-16.